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**THE BEES OF NEW MEXICO.**

BY T. D. A. COCKERELL.

More species of bees are known from New Mexico than from any other State or Territory. This is not to be explained merely as the result of diligent collecting,—indeed the work done does not nearly cover the ground, and whole regions, and doubtless dozens of species, remain unknown. The vast area—difficult to appreciate unless one has travelled over it—and the combination of desert, mountain and valley afford such a variety of conditions that we have in fact not one fauna, but several; and any statements about New Mexico, without further details, become comparatively meaningless. If proof is wanted, that in spite of all that has been done, abundant riches remain, it is afforded by the results of the Academy of Natural Sciences expedition to Alamogordo and the Sacramento Mountains several years ago. I went over most of the bees collected by Mr. Viereck, when he visited me at Las Vegas, and was interested to see many new species, even several of the genus *Perdita*, which had been my especial study. Unfortunately, much of this material still remains undescribed or unreported, and I am unable to incorporate all the important data it would afford. There is no doubt that bees, from the number of species, the ease with which they are collected, and the restricted distribution of many, afford excellent material for defining zoological regions and life zones. That they have not been used to any extent for such purposes must be explained by the inadequacy of existing collections and records, and especially the difficulty of determining the species. The difficulties of determination are not especially the fault of those who have described these insects, but necessarily result from the extraordinary wealth of still undescribed species. An insect may appear to be so and-so, but it is necessary to examine it with great care, as it may present some peculiarity, in some part of its anatomy, showing it to be a hitherto unknown form. Thus it will not be safe to trust to superficial appearances until the fauna has been much more thoroughly worked up.

In the following enumeration of New Mexico bees, I have divided the species of each genus into groups according to their zonal distri-

bution. It is hoped that this method may be of service to those who are working on the distribution of bees, while of course all subsequent studies concerned with the same species will tend to establish or disprove the validity of my groupings. It will be noted that while the majority of the species are characteristic of particular zones, or are at least especially austral or boreal, a few range widely through many zones.

I have not given all the details of dates and flower-records, etc., most of which have already appeared in connection with the descriptions and records of the species in various publications.\*

The following abbreviations are used :

Localities: M. V. = Mesilla Valley; L. V. = Las Vegas; L. V. H. S. = Las Vegas Hot Springs; S. F. = Santa Fé.

Collectors: C. = T. D. A. Cockerell; W. P. C. = Wilmatte Porter Cockerell; V. = H. L. Viereck.

Particulars concerning the localities will be found in Proc. Davenport Acad. Sci., IX, pp. 8-14.

An asterisk following the name of a locality signifies that it is the type locality of the species or subspecies.

### **PROSOPIS** Fabr.

#### *Hudsonian to Canadian.*

*P. basalis* Smith. Top of Las Vegas Range (11,000 ft.); Beulah.

*P. varifrons* Cress. Top of Las Vegas Range; Beulah; Dailey Canon.

#### *Canadian Zone.*

*P. antennata* Cress. Beulah, prox. 8000 ft. Fls. *Roripa*.

*P. rudbeckiæ ruidosensis* Ckll. Beulah; Rio Ruidoso.\* Fls. *Scrophularia*.

*P. tridens* Ckll. Beulah. Typ. loc. in Colo., at 7000 ft.

*P. rugosula* Ckll. Beulah. Typ. loc. in Colo., at 9500 ft. Fls. *Roripa*.

*P. digitata* Ckll. Beulah. Typ. loc. in Colo.

*P. nucleolus* Vier. Beulah.\* Fls. *Salix*.

*P. ænigma* Vier. Beulah.\*

*P. clandestina* Vier. Beulah.\*

*P. citrinifrons* Ckll. Beulah. Typ. loc. in Colo., at 8500 ft.

*P. wootoni* Ckll. Beulah; Rio Ruidoso.\* Fls. *Scrophularia*.

*P. tuertonis* Ckll. Tuerto Mtn., near S. F., 8550 ft.\*; also Florissant, Colo. (Rohwer.) This is the species cited without name in *Entomologist*, 1898. p. 217 (Q).

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\* See especially Tables for the Determination of New Mexico Bees, in Bull. Sci. Lab. Denison University, Vol. XI (1898).

*Canadian and Transition.*

- P. tridentula* Ckll. Beulah; Mescalero; Rio Ruidoso. Typ. loc. in Colo., at 9500 ft.

*Transition Zone.*

- P. rudbeckiæ* Ckll. and Casad. S. F.\* (7000 ft.)

*Upper Sonoran Zone.*

- P. divergens* Ckll. Pecos. Typ. loc. in Colo., at 7000 ft.  
*P. asinina bigeloviæ* Ckll. Albuquerque.\*

*Upper to Middle Sonoran.*

- P. mesillæ* Ckll. M. V.,\* L. V., Pecos. Extends to Phoenix, Ariz. (Lower Sonoran.)  
*P. asinina* Ckll. and Casad. M. V.,\* Pecos.

**COLLETES** Latr.

The new records, of which details are given, are derived from a small series kindly identified by Mr. Swenk.

*Hudsonian to Canadian.*

- C. nigrifrons* Titus. Top of Las Vegas Range; Crew's Mesa; Beulah (B. Chapman).  
*C. oromontis* Vier. Top of Las Vegas Range, June 28th, ♀ (C.); Beulah.\*

*Canadian Zone.*

- C. bigeloviæ* Ckll. Beulah; Sacramento Mts.\*  
*C. brevispinosus* Vier. Beulah.\* Mr. Swenk believes that *bigeloviæ* and *brevispinosus* ought not to be separated from *armatus*.  
*C. kincaidii* Ckll. Rio Ruidoso.  
*C. spurcus* Vier. Beulah\*; Dailey Canon, Aug. 10th (T. and W. Ckll.).  
*C. delodontus* Vier. Beulah.\* Fls. *Roripa*.  
*C. paniscus* Vier. Beulah.\*  
*C. zonatus* Vier. Beulah.\* Fls. *Prunus*.

*Canadian to Upper Sonoran.*

- C. simulans* Cress. Beulah (M. D. Ckll.); Embudo. Mr. Viereck states that Cresson's *simulans* included two species, one with, the other without, dark hairs on the thorax above. He considers the latter the true type, though I took the former for such in my table in *Psyche*, October, 1905. Mr. Swenk writes that he now believes that the insect be recorded as *simulans* from Olympia, Wash., was only a small *kincaidii*; he also holds that my *C. andrewsi* is the ♀ of true *simulans*, of which he has both sexes from Sioux Co., Nebraska.  
*C. skinneri* Vier. Beulah\*; Pecos, Aug. 31st (C.).

*Canadian to Middle Sonoran.*

- C. armata* Patton. Beulah (C., W. P. C.); Sapello Canon, Aug. 31st (W. P. C.); San Ignacio, Sept. 1st (T. and W. Ckll.); Albuquerque; M. V. The identifications of Canadian and Transition Zone material are by Mr. Swenk, and probably refer to the segregated forms cited above as *bigelovix* and *brevispinosus*.

*Transition Zone.*

- C. chamæsarachæ* Ckll. S. F.\* Fls. *Chamæsaracha*.  
*C. aberrans* Ckll. S. F.\* Mr. Swenk has found this a common visitor of *Petalostemon* on the Nebraska sand hills.

*Transition to Upper Sonoran.*

- C. gilensis* Ckll. Gila River\*; Gallinas River; Sacramento Mts.; Pecos; L. V., Aug. 9, fls. *Melilotus alba*, ♀ (W. P. C.), Aug. 11th, fls. *Solidago canadensis* (W. P. C.).

*Transition to Middle Sonoran.*

- C. utilis* Ckll. High Rolls (V.); M. V.\*  
*C. americana* Cress. S. F.; Gila River; Tuerto Mtn.; Embudo; Watrous; L. V.; M. V.

*Upper Sonoran.*

- C. wilmattæ* Ckll. Pecos.\* Mr. Swenk has taken this in Nebraska, and finds it an oligotropic visitor of *Petalostemon*.  
*C. robustus* Swenk. L. V., July 21, ♀, fls. *Petalostemon oligophyllus* (C.), Aug. 11, ♀, fls. *Solidago canadensis* (W. P. C.). Mr. Swenk now holds that this is identical with *C. robertsonii* D. T.  
*C. tegularis* Swenk. Albuquerque, Aug., 1894, ♀ (Snow), fide Swenk.  
*C. wootoni* Ckl. Rio Ruidoso, 6400 ft.\*; Riley's Ranch, Organ Mts., Aug. 29. fls. *Lippia wrightii*, ♂ (C.); M. V.

*Middle Sonoran.*

- C. crucis* Ckll. M. V.\*  
*C. daleæ* Ckll. M. V.\*  
*C. texana* Cress. M. V. Fls. *Salix*.  
*C. prosopidis* Ckll. M. V.\* Fls. *Prosopis*.  
*C. salicicola* Ckll. M. V.\* Fls. *Salix*.  
*C. annæ* Ckll. M. V.\*  
*C. louisæ* Ckll. M. V.\*  
*C. gypsicolens* Ckll. White Sands.\*  
*C. algarobiæ* Ckll. M. V.\* Fls. *Prosopis*.

**CAUPOLICANA** Spinola.

- C. yarrowi* Cress. Albuquerque (Snow, 1894); El Rito; Organ Mts.

**SPHECODES** Latr.*Canadian Zone.*

- S. fragariæ* Ckll. Beulah.\*

*Transition Zone.*

*S. asclepiadis* Ckll. S. F.\*

*Upper Sonoran Zone.*

*S. veganus* Ckll. L. V.\*

*S. arroyanus* Ckll. L. V. (Arroyo Pecos).\*

*S. pecosensis* Ckll. Pecos.\*

*Upper and Middle Sonoran.*

*S. mandibularis* Cress. Mescalero; M. V.

*Middle Sonoran.*

*S. semicoloratus* Ckll. M. V.\*

*S. fortior* Ckll. M. V.\*

*S. sophiæ* Ckll. M. V.\*

*S. perlustrans* Ckll. M. V.\*

**PROTERANER** Robt.

*P. rhois* Ckll. Rio Ruidoso.\*

**SPHECODOGASTRA** Ashm.

*S. texana* Cress. M. V.

**HALICTUS** Latr.*Hudsonian Zone.*

*H. virgatellus* Ckll. Top of Las Vegas Range.\*

*H. dasiphoræ* Ckll. Top of Las Vegas Range.\*

*H. veganus* Ckll. Top of Las Vegas Range.\*

*H. peraltus* Ckll. Top of Las Vegas Range.\*

*Hudsonian to Canadian.*

*H. hemimelas* Ckll. Top of Las Vegas Range\*; Cloudcroft (V.).

*Canadian Zone.*

*H. aquilæ* Ckll. Harvey's Ranch (9600 ft.); White Mts.\*; Beulah.

*H. similis* Smith. Dailey Canon.

*H. parallelus* Say. Beulah.

*H. niger* Vier. Beulah.\*

*Canadian to Transition.*

*H. lerouxii* Lep. Beulah; L. V. H. S.

*H. semicæruleus* Ckll. Cloudcroft (V.). S. F.\*

*Canadian to Upper Sonoran.*

*H. trizonatus* Cress. Beulah; Rio Ruidoso; Trout Spring; Bernalillo; Paraje; Pecos; Johnson Park, July 4, fls. *Rosa* (Anna Gohrman). This is what has been previously reported as *coriaceus* Sm.; Mr. Crawford states that it is distinct from the true *coriaceus* of the E. States.

*Canadian to Middle Sonoran.*

- H. bardus* Cress. Beulah; Organ Mts.; M. V.  
*H. sisymbrii* Ckll. Beulah; S. F.; L. V.; Watrons; M. V.\*  
*H. ruidosensis* Ckll. Beulah; S. F.; Rio Ruidoso\*; Mescalero; Pecos; M. V.; Alamogordo (V.).

*Transition.*

- H. pecosensis* Crawf. Pecos Canon, 7200 ft. Fls. *Holodiscus*.\*

*Transition to Upper Sonoran.*

- H. ovaliceps* Ckll. S. F.\*; Pecos.  
*H. tripartitus* Ckll. S. F.\*; Organ Mts.  
*H. perdifficilis* Ckll. S. F.\*; Mescalero; Placita; Pecos.

*Transition to Middle Sonoran.*

- H. cockerelli* Crawf. S. F.\*; Mesilla.  
*H. armaticeps* Cress. S. F.; L. V.; Mescalero; M. V.; Raton.  
*H. pectoraloides* Ckll. S. F.; Roswell; M. V.\*  
*H. subobscurus* Ckll. S. F.; M. V.\*

*Upper Sonoran.*

- H. forbesi* Rob. Mescalero.  
*H. galpinsiæ* Ckll. Pecos\*; L. V.  
*H. clematisellus* Ckll. Pecos.\*

*Upper to Middle Sonoran.*

- H. amicus* Ckll. Gila River; Organ Mts.; M. V.\*  
*H. tripartitus melliloti* Ckll. Mescalero; M. V.\* Extends to Phoenix, Ariz.  
 (Lower Sonoran.)  
*H. pruinosisiformis* Crawf. Pecos; L. V.; M. V. This has been referred in error to *pruinosis* Rob.  
*H. mesillensis* Ckll. L. V., M. V.\*

*Middle Sonoran.*

- H. angustior* Ckll. M. V.\*  
*H. pseudotegularis* Ckll. M. V. Type locality in tropical Mexico, and Mr. Crawford has it from Costa Rica.  
*H. oleosus* Ckll. M. V.\*  
*H. semibrunneus* Ckll. M. V.\*  
*H. ashmeadi* Rob. M. V.

**DIALICTUS** Rob.*Upper Sonoran.*

- D. occidentalis* Crawf. L. V.\*  
*D. theodori* Crawf. L. V.\*

**CONANTHALICTUS** Ckll.**C. conanthi** Ckll. M. V.\*

Mr. Crawford has sent me an allied species of this genus from Cotulla, Texas.

**HEMIHALICTUS** Ckll.**H. lustrans** Ckll. L. V., Lone Mtn.\***AUGOCHLORA** Smith.**A. neglectula** Ckll. M. V., Organ Mts.\***A. confusa** Rob. Trout Spring.**A. confusa coloradensis** Titus. Mesilla Park (M. D. Ckll.); Roswell.**AGAPOSTEMON** Smith.*Transition to Middle Sonoran.***A. texanus** Cress. S. F.; Mescalero; Gila R.; Romersville; L. V.; Embudo;  
Gallinas R. at Las Valles; Pecos; M. V.; Organ Mts.*Upper Sonoran.***A. viridulus** Fabr. La Cueva, Organ Mts.*Middle Sonoran.***A. melliventris** Cress. Vega S. José; Rincon; M. V.**A. radiatus** Say. M. V.**A. cockerelli** Crawf. M. V.\***ANDRENA** Fabr.*Hudsonian Zone.***A. merriami** Ckll. Top of Las Vegas Range.\**Hudsonian to Canadian.***A. birtwelli** Ckll. Top of Las Vegas Range;\* Beulah, fls. *Heracleum*. In Colorado this has been taken at a much lower altitude (Colorado Springs, 6000 ft.).*Hudsonian to Transition.***A. apacheorum** Ckll. Top of Las Vegas Range; Beulah; Mescalero; Sacramento Mts.\**Canadian Zone.***A. sapellonis** Ckll. Beulah, fls. *Thlaspi*.\***A. carlini** Ckll. Beulah. Typ. loc. in Illinois.**A. pacta** Vier. Beulah.\***A. grandior** Ckll. Beulah.**A. segregans** Ckll. Beulah.\***A. atala** Vier. Beulah.\* Visits *Polemonium* at Florissant, Colorado.**A. delta** Vier. Beulah.\***A. barberi** Ckll. Rio Ruidoso.\*



*A. chromotricha* Ckll. Rio Ruidoso.

*A. chromotricha beulahensis* Vier. Beulah.\* Mr. Viereck now holds that his *A. beulahensis* is a variety of *chromotricha*.

*A. chromotricha clypeonitens* Ckll. Beulah. Mr. Viereck considers that his *A. truncata* is identical with *clypeonitens* (described from Wisconsin), and believes that the latter is a variety of *chromotricha*.

*A. occidentalis* Ckll. Beulah; Santa Fé Canon.\* This was described as a variety of *platyparia* Rob. (*fragilis* Smith), and was later even considered doubtful as a variety. Upon comparison with a male *platyparia* from Milwaukee, received from Dr. Graenicher, I find that *occidentalis* is apparently a distinct species; known by its larger head, with the eyes diverging below, and the sides of the vertex (viewed from in front) presenting a more distinct angle.

#### *Canadian to Transition.*

*A. hirticincta* Prov. Beulah; San Ignacio.

#### *Canadian to Upper Sonoran.*

*A. argemonis* Ckll. Beulah; S. F.\*; Rio Ruidoso; Las Valles; San Germino; Pecos; Glorieta, fls. *Argemone intermedia*; L. V.; Beatty's Cabin (W. P. C.).

*A. helianthi* Rob. Beulah (var. ♂, with hair of thorax bright ferruginous); Rociada; Pecos; L. V.; Albuquerque.

#### *Transition.*

*A. cerasifolli* Ckll. S. F.\*

*A. johnsoniana* Ckll. Johnson Mesa.\*

*A. xanthigera* Ckll. San Ignacio.\*

*A. canadensis* D. T. (*simulata* Prov.) San Ignacio. The record relates to *A. albovirgata* Ckll., which Mr. Viereck says he cannot separate from *simulata*.

*A. nitidior* Ckll. San Ignacio.\*

*A. semirufa* Ckll. L. V. H. S.\*

*A. erythrogastra* Ashm. Placita. Typ. loc. in Colorado.

*A. pluvialis* Ckll. Placita. Typ. loc. Olympia, Wash.

#### *Transition to Upper Sonoran.*

*A. placitæ* Ckll. Placita\*; L. V.

*A. cratægi* Rob. L. V. H. S. (a variety); Pecos (det. Viereck).

*A. cressoni kansensis* Ckll. Placita; Las Valles; both localities are on the Gallinas River.

*A. aureocincta* Ckll. S. F.\*; Glorieta, fls. *Gutierrezia sarothræ*, Aug. 23, ♂ (W. P. C.); Pecos, Sept.; San Ignacio.

*A. mentzeliiæ* Ckll. S. F.\*; Pecos.

*A. porteriæ* Ckll. L. V. H. S.,\* and down the Gallinas R. well into the Upper Austral.

#### *Transition to Middle Sonoran.*

*A. mimetica* Ckll. Placita\*; Alamogordo, May 26-29 (V.).

*A. prunorum* Ckll. S. F.; Las Valles; Pecos; Paraje; Johnson Park, July 4, fls. *Rosa* (Anna Gohrman); M. V.\*

*Upper Sonoran.*

- A. aliciarum* Ckll. Organ Mts.\*  
*A. vulpicolor* Ckll. Embudo.\*  
*A. prunifloris* Ckll. Paraje.\* The locality of this and the next is almost Middle Sonoran.  
*A. subaustralis* Ckll. Paraje.\* Mr. Viereck has recorded this species from Oregon, Washington and Vancouver Island, a most unexpected range!

*Upper to Middle Sonoran.*

- A. sphecodina* Casad. & Ckll. Paraje; M. V.\* This scarcely enters the Upper Sonoran, Paraje being on the border of the Middle Sonoran.  
*A. mellea* Cress. L. V.; Pecos, June 26; Glorieta, fls. *Argemone intermedia*, Aug. 23, ♀; Alamogordo (V.). This is more especially an Upper Sonoran form.  
*A. salicinella* Ckll. Las Valles; Paraje; M. V.\* North to Boulder, Colo.

*Middle Sonoran.*

- A. mesillæ* Ckll. M. V.\*  
*A. prima* Casad. M. V.\*  
*A. jessicæ* Ckll. M. V.\*  
*A. casadæ* Ckll. M. V.\*  
*A. nigerrima* Casad. M. V.\*  
*A. pulchella* Rob. M. V.  
*A. capricornis* Casad. and Ckll. M. V.\*  
*A. primulifrons* Casad. M. V.\*  
*A. fracta* Casad. and Ckll. M. V.\*  
*A. electrica* Casad. and Ckll. M. V.\*  
*A. monilicornis* Ckll. M. V.\*

**CALLANDRENA** Ckll.

- C. pectidis* Ckll. M. V.\*; flies in September, fls. *Pectis*.

**PARANDRENA** Rob.

- P. andrenoides* Cress. Gallinas River; Paraje; M. V.

**HESPERAPIS** Ckll.*Middle Sonoran.*

- H. oliviæ* Ckll. M. V.\*; flies in September, fls. *Pectis*.  
*H. rhodocerata* Ckll. M. V.\*; flies in September, fls. *Pectis* and *Verbesina*.  
*H. elegantula* Ckll. M. V.\*; flies in April.  
*H. n. sp.* Vier. Alamogordo (V.); Mesilla Park, May 16. Fls. *Larrea* (C.).

**PROTOXÆA** Ckll. and Porter.

- P. gloriosa* Fox. M. V.\*

**NOMIA** Latr.

I omit the two species described from the "Santa Fé district" by Cameron, as they are doubtless Mexican. I also omit the *Oxæa* and *Osmia* from the same collection.

*Transition to Middle Sonoran.*

*N. foxii* D. T. S. F.; Rincon; M. V.; Vega S. José. Typ. loc. Denver, Colo.

*Upper and Middle Sonoran.*

*N. nevadensis* Cress. Albuquerque; La Luz; M. V.

*N. triangulifera* Vachal. Albuquerque; M. V., flies in Sept., fls. *Helianthus*.

*N. nortoni* Cress. L. V.; Roswell. This and *foxii* seem not to occupy the same ground, *foxii* being more western.

**DIEUNOMIA** Ckll.

*D. apache* Cress. "New Mexico."

*D. marginipennis* Cress. "New Mexico."

*D. xerophila* Ckll. Aztec; M. V.,\* flies in Sept., fls. *Verbesina*.

*D. mesillæ* Ckll. M. V.,\* flies in July.

**PROTANDRENA** Ckll.*Transition to Upper Sonoran.*

*P. asclepiadis* Ckll. S. F.\*; Albuquerque.

*Upper Sonoran.*

*P. trifoliata* Ckll. Albuquerque.\*

*Middle Sonoran.*

*P. mexicanorum* Ckll. M. V.

*P. heteromorpha* Ckll. M. V.\*

**HALICTOIDES** Nyl.*Hudsonian Zone.*

*H. maurus* Cress. Top of Las Vegas Range.

*Canadian Zone.*

*H. harveyi* Ckll. Harvey's Ranch, Las Vegas Mts.\*

*H. oryx* Vier. Beulah.\*

*Canadian to Middle Sonoran.*

*H. marginatus* Cress. Beulah; S. F.; Rinconada; M. V.

*Upper Sonoran.*

*H. tinsleyi* Ckll. Organ Mts.\*

*Middle Sonoran.*

*H. fallugiæ* Ckll. M. V.,\* end of April, fls. *Fallugia*.

**PSEUDOPANURGUS** Ckll.

*P. pectidellus* Ckll. Organ Mts.,\* in Aug., fls. *Pectis*, in company with *Perdita solitaria*.

*P. æthiops* Cress. Albuquerque; M. V. Fls. *Helianthus*.

*P. fraterculus* Ckll. Albuquerque; M. V.\* Fls. *Isocoma*.

**PANURGINUS** Nyl.*Hudsonian to Canadian.*

- P. verus* Ckll. Top of Las Vegas Range\*; Crew's Mesa; Beulah.  
*P. bakeri* Ckll. Top of Las Vegas Range; Beulah.  
*P. cressoniellus* Ckll. Top of Las Vegas Range; Beulah.

*Canadian Zone.*

- P. porterae* Ckll. Beulah.\*  
*P. atricornis* Cress. Beulah.  
*P. nigrinus* Vier. Beulah.\*  
*P. citrinifrons* Vier. Beulah.\*  
*P. neomexicanus* Ckll. Rio Ruidoso.\*

*Transition Zone.*

- P. albitarsis* Cress. S. F. Fls. *Rudbeckia*.

*Transition to Upper Sonoran.*

- P. boylei* Ckll. S. F.,\* L. V. Fls. *Cleome*.  
*P. pauper flavotincta* Ckll. S. F.,\* L. V., Organ Mts.  
*P. innuptus* Ckll. Mescalero. This locality is on the border of the Transition and Upper Sonoran.  
*P. barberi* Ckll. Mescalero.\*

*Upper Sonoran.*

- P. townsendi* Ckll. Organ Mts.\*  
*P. hirsutifrons* Ckll. Albuquerque.\*

*Middle Sonoran.*

- P. renimaculatus* Ckll. M. V. Typ. loc. in Colo., fls. *Solidago*.  
*P. perlævis* Ckll. M. V.\*

**SPINOLIELLA** Ashm.

- S. scitula* Cress. S. F.; L. V.  
*S. australior* Ckll. Albuquerque\*; M. V.  
*S. meliloti* Ckll. M. V.\* Fls. *Melilotus*.

**CALLIOPSIS** Smith.*Transition.*

- C. rhodophilus* Ckll. S. F.\*

*Transition to Upper Sonoran.*

- C. coloradensis* Cress. S. F.; L. V.; Embudo; Organ Mts.; Glorieta, fls. *Gutierrezia sarothræ*, Aug. 23 (W. P. C.).

*Upper Sonoran.*

*C. lepidus* Cress. L. V.

*C. teucarii* Ckll. L. V.\*

*C. verbenæ* Ckll. and Porter. L. V.\*; Pecos, July 7, fls. *Verbena bipinnatifida*.

*C. chlorops* Ckll. L. V.\*; Pecos.

*Middle Sonoran.*

*C. coloratipes* Ckll. M. V.\* Extends to Phoenix, Ariz. (Lower Sonoran).  
Fls. *Isocoma*.

**HYPOMACROTERA** Ckll and Porter.*Upper Sonoran.*

*H. callops* Ckll. and Porter. L. V.\*, in August, fls. *Chamæsaracha*.

*Middle Sonoran.*

*H. semirufa* Ckll. M. V.\*

*H. subalpina* Ckll. M. V.\*

**MACROTEROPSIS** Ashm.

*M. latior* Ckll. M. V.\*

**PERDITA** Smith.*Canadian to Upper Sonoran.*

*P. zebrata* Cress. Beulah (very rare); Gallinas River; S. F.; L. V.; Pecos; Glorieta, Aug. 23, fls. *Cleome*; Albuquerque; Lamy; Watrous; Alma, Socorro County.

*Transition.*

*P. foxi* Ckll. S. F.\*

*P. snowi* Ckll. S. F.

*Transition to Upper Sonoran.*

*P. chamæsarachæ* Ckll. S. F.; L. V.; Albuquerque\*; Roswell.

*P. sexmaculata* Ckll. S. F.\*; L. V.; Roswell. Fls. *Chamæsaracha*.

*P. sphæralcææ alticola* Ckll. S. F.\*; Pecos. The mut. *suffusa* Ckll. has the same range.

*P. mentzelizæ* Ckll. S. F.\*; Pecos; near Tularosa (Wooton); Raton. At Pecos it visits the flowers of *Nuttallia rusbyi* (*Mentzelia rusbyi* Wooton, 1898).

*P. lepachidis* Ckll. S. F.\*; Socorro.

*Upper Sonoran.*

*P. stottleri* Ckll. Sacramento Mts.\*; Pecos, fls. *Gutierrezia*.

*P. phacelizæ* Ckll. Organ Mts.\*

*P. anogræ* Ckll. L. V.\*

*P. mentzeliarum* Ckll. Organ Mts.\*; near Tularosa (Wooton).

*P. mentzeliarum lauta* Ckll. Near Tularosa\* (Wooton). Three species of *Perdita* were taken by Wooton at flowers of a *Nuttallia* doubtfully referred at the time to "*wrightii* or *multiflora*," but no doubt really *Nuttallia perennis* (*Mentzelia perennis* Wooton, 1898).

- P. crotonis* Ckll. La Tenaja; between Rowe and Old Pecos Pueblo, fls. *Croton*, Sept. 4 (W. P. C.); Albuquerque.\*
- P. gutierreziae* Ckll. Albuquerque.\*
- P. albipennis* Cress. Albuquerque.
- P. affinis* Cress. Embudo; Pecos. Aug. 24, fls. *Grindelia inornata*, ♂, ♀ (W. P. C.); Glorieta, Aug. 23, fls. *Chrysopsis villosa*, ♂, ♀ (W. P. C.).
- P. woottonae* Ckll. Near Tularosa.\*
- P. rhodura* Ckll. Embudo.\*
- P. subfasciata* Ckll. Embudo.\*
- P. solitaria* Ckll. Organ Mts.\*
- P. chrysophila* Ckll. Pecos; Organ Mts.\*

*Upper to Middle Sonoran.*

- P. grandiceps* Ckll. Organ Mts.; M. V.\*; Alamogordo (V.).
- P. pulchrior* Ckll. Albuquerque\*; M. V.
- P. sphæralceæ* Ckll. Organ Mts.; M. V.\*; Alamogordo (V.).
- P. pallidior* Ckll. Albuquerque\*; M. V.
- P. crassiceps* Ckll. Albuquerque\*; M. V.
- P. bigeloviae* Ckll. Albuquerque\*; M. V.
- P. townsendi* Ckll. Embudo; White Sands.\*
- P. albovittata* Ckll. Organ Mts.\*; M. V.
- P. austini* Ckll. Albuquerque\*; M. V.

*Middle Sonoran.*

- P. beata* Ckll. M. V.\*
- P. luteola* Ckll. M. V.\*
- P. larreæ* Ckll. San Marcial.\*
- P. larreæ modesta* Ckll. M. V.\*
- P. marcialis* Ckll. San Marcial\*; Alamogordo (V.).
- P. punctosignata* Ckll. M. V.\* Extends to S. José de Guaymas, Mex. (Lower Sonoran).
- P. maculigera* Ckll. M. V.\*
- P. semicrocea* Ckll. M. V.\*
- P. sidæ* Ckll. M. V.\*
- P. cladotrichis* Ckll. M. V.\*
- P. æneifrons* Ckll. M. V.\*
- P. semicærulea* Ckll. San Marcial\*; Alamogordo (V.).
- P. phymatæ* Ckll. M. V.\*
- P. pellucida* Ckll. M. V.\*
- P. pectidis* Ckll. M. V.\*
- P. perpulchra* Ckll. M. V.\*
- P. biparticeps* Ckll. M. V.\*
- P. erigeronis* Ckll. M. V.\*
- P. hirsuta* Ckll. M. V.\*
- P. maculipes* Ckll. M. V.\*
- P. martini* Ckll. M. V.\*
- P. salicis* Ckll. M. V.\* Extends to S. José de Guaymas, Mex. (Lower Sonoran).
- P. nitidella* Ckll. M. V.\*

- P. exclamans* Ckll. M. V.\* Extends to S. José de Guaymas, Mexico (Lower Sonoran).  
*P. senecionis* Ckll. M. V.\*  
*P. verbesinæ* Ckll. M. V.\*; with mutations *nigrior* Ckll., *intermedia* Ckll., *maculata* Ckll. and *cyarella* Ckll.  
*P. asteris* Ckll. M. V.\* Extends to Salt River Valley, Ariz. (Lower Sonoran).  
*P. larrearum* Ckll. San Marcial.\*  
*P. vagans* Ckll. M. V.\*  
*P. vespertilio* Ckll. M. V.\*  
*P. chrysoceras* Ckll. M. V.\*  
*P. ignota* Ckll. M. V.\*  
*P. fallax* Ckll. M. V.\*  
*P. albipennis helianthi* Ckll. M. V.\*  
*P. callicerata* Ckll. M. V.\*  
*P. numerata* Ckll. M. V.\*  
*P. laticeps* Ckll. M. V.\*  
*P. tarda* Ckll. M. V.\* Extends, in modified form, to S. José de Guaymas, Mex. (Lower Sonoran).  
*P. howardi* Ckll. Alamogordo (V.). Typ. loc. San José de Guaymas, Mexico (Lower Sonoran).  
*P. n. sp.* Vier. Alamogordo, at *Dasytirion* (V.).

*Locality Unknown.*

- P. nuda* Ckll. "New Mexico."\*

**NOMADA** Fabr.

*Canadian Zone.*

- N. zebrata* Cress. Beulah; Eagle Creek, White Mts.  
*N. beulahensis* Ckll. Beulah.\*  
*N. aquilarum* Ckll. Eagle Creek, White Mts.\*  
*N. schwarzi contractula* Ckll. Beulah.\*  
*N. ruidosensis* Ckll. Rio Ruidoso.\*

*Canadian to Upper Sonoran.*

- N. taraxacella* Ckll. Near Viveash Ranch, 8800 ft.; Pecos; Placita.\*

*Transition to Upper Sonoran.*

- N. vegana* Ckll. S. F.; L. V.\*

*Upper Sonoran.*

- N. xanthophila* Ckll. L. V.\*  
*N. fragilis* Cress. Pecos, fls. *Salix*.  
*N. placitensis* Ckll. Placita,\* fls. *Prunus*.  
*N. lippiae* Ckll. La Cueva, Organ Mts.\* Visits *Lippia*.  
*N. pecosensis* Ckll. Pecos.\*  
*N. vallesina* Ckll. Las Valles.\*

*Middle Sonoran.*

- N. martinella* Ckll. M. V.\*  
*N. crucis* Ckll. M. V.\* Visits *Verbesina*.  
*N. pennigera* Ckll. M. V.\*  
*N. sidæfloris* Ckll. M. V.\*  
*N. gutierreziae* Ckll. M. V.\*  
*N. vierecki* Ckll. M. V. Visits *Aster* and *Dithyrea*. Type loc. Juarez, Mexico (Middle Sonoran).  
*N. neomexicana* Ckll. Rincon; Deming.\* Visits *Verbesina* and *Prosopis*.  
*N. sophiarum* Ckll. M. V.\* Visits *Sophia*.

**NEOLARRA** Ashm.

- N. pruinosa* Ashm. Glorieta, Aug. 23; M. V. Type loc. West Cliff, Colorado, 7840 ft.  
*N. verbesinæ* Ckll. M. V.\*

**PHILEREMULUS** Ckll.

- P. vigilans* Ckll. M. V.\*  
*P. nanus* Ckll. S. F.\*; L. V.

**NEOPASITES** Ashm.

- N. pulchellus* Cress. S. F. Type from Colorado; I took it at Colorado Springs, June 20, 1906.

**DIOXYS** Lep.

- D. productus subruber* Ckll. M. V.\*  
*D. martii* Ckll. Picacho Mtn., M. V.\*, March 25, fls. *Sphaeralcea martii*.

**PHILEREMUS** Latr.

- P. americanus* Cress. Beulah. Type from Canada.  
*P. mesillæ* Ckll. M. V.\*

**EPEOLUS** Latr.

- E. beulahensis* Ckll. Beulah.\*  
*E. crucis* Ckll. M. V.\*

**TRIEPEOLUS** Rob.*Canadian to Upper Sonoran.*

- T. occidentalis* Cress. Beulah (? was *fraseræ*); Mescalero. Type from Colo.  
*T. cressoni fraseræ* Ckll. Beulah\*; L. V.

*Transition to Upper Sonoran.*

- T. cressoni* Rob. San Ignacio; L. V.  
*T. helianthi* Rob. Near San Ignacio; Aztec.

*Transition to Middle Sonoran.*

- T. segregatus* Ckll. S. F.; L. V. H. S.\*; L. V.; Albuquerque (? was *isocomæ*); M. V.



*Upper Sonoran.*

- T. martini* Ckll. Romeroville.\*  
*T. nevadensis* Cress. Albuquerque. Type from Nevada.  
*T. isocomæ* Ckll. Albuquerque.\*

*Upper to Middle Sonoran.*

- T. lunatus* Say. Organ Mts.; M. V.

*Middle Sonoran.*

- T. verbesinæ* Ckll. M. V.; Deming.\*  
*T. texanus* Cress. M. V. Type from Texas.  
*T. texanus nigripes* Ckll. M. V.\*  
*T. mesillæ* Ckll. M. V.\*

*Locality Unknown.*

- T. robustus* Cress. "New Mexico."\*  
*T. concavus* Cress. "New Mexico."\*

**ERICROCIS** Cress.

- E. lata* Cress. M. V. Type from Texas.

**MELECTA** Latr.

- M. miranda* Fox. S. F.; L. V.; Pecos, at nests of *Anthophora occidentalis* (W. P. C.); Mescalero; M. V. Typ. loc. Rapid City, S. Dak.  
*M. interrupta fallugiæ* Ckll. Vega S. José; Continental Divide; Pecos,\* fls.  
*Fallugia* (Grabham).  
*M. interrupta rociadensis* Ckll. Rociada.\*

**ZACOSMIA** Ashm.

- Z. maculata* Cress. M. V. Type from Nevada.

**BOMBOMELECTA** Patton.

- B. fulvida* Cress. M. V. Type from Nevada.  
*B. alfredi* Ckll. M. V.\*  
*B. larreæ* Ckll. M. V.\*

**STELIS** Panz.

- S. rudbeckiarum* Ckll. S. F.\*; Gila River.  
*S. permaculata* Ckll. S. F.\*

**ANTHIDIUM** Fabr.*Canadian to Upper Sonoran.*

- A. occidentale* Cress. Beulah; San Ignacio; Pecos, Aug. 4; Glorieta, August 23; Raton.

*Canadian to Middle Sonoran.*

- A. maculosum* Cress. Tuerto Mtn., 8025 ft.; Barela Mesa (A. Gohrman); Mescalero; top of Organ Mts.; L. V.; M. V. Type from Utah.

*Upper Sonoran.*

- A. cognatum* Cress. Organ Mts. Type from Georgia.  
*A. lupinellum* Ckll. Pecos.\*  
*A. pecosense* Ckll. Pecos.\*

*Upper to Middle Sonoran.*

- A. porterae* Ckll. L. V.\*; Pecos (mut. *amabile* Ckll.); M. V. The mut. *amabile* was taken at Boulder, Col., Aug. 5, 1906.

*Middle Sonoran.*

- A. parosetae* Ckll. M. V.\*

*Locality Unknown.*

- A. emarginatum* Say (*atrifrons* Cress.). "New Mexico." In Colorado this occurs from the Canadian Zone (Ward) to the border of the Upper Sonoran (Boulder).

**DIANTHIDIUM** Ckll.

- D. perpictum* Ckll. Beulah (1 ♂); Rio Ruidoso\*; L. V.  
*D. gilense* Ckll. Gila River\*; Las Valles; Pecos, fls. *Geranium atropurpureum*. Aug. 21, ♀ (W. P. C.).  
*D. parvum* Cress. S. F.; L. V.; Pecos; Organ Mts.  
*D. curvatum* Smith. Albuquerque; Chaves; M. V.  
*D. larreae* Ckll. M. V.\*

**MONUMETHA** Cress.

- M. albifrons* Kirby. Beulah; Mescalero.

**OSMIA** Panz.*Hudsonian Zone.*

- O. inurbana* Cress., var. (Mr. Titus thinks probably a distinct species). Top of Las Vegas Range; cf. *Psyche*, Dec., 1901, p. 283.

*Hudsonian to Transition.*

- O. faceta* Cress. Top of Las Vegas Range; Beulah; Mescalero.

*Canadian Zone.*

- O. fulgida* Cress. Beulah.  
*O. armaticeps sapellonis* Ckll. Beulah.\*  
*O. megacephala* Cress. Head of Dailey Canon, Las Vegas Mts.  
*O. densa* Cress. Beulah.  
*O. nigrifrons* Cress. Beulah; Johnson Park, July 4, fls. laco-weed (A. Gohrman).  
*O. nigrifrons subaustralis* Ckll. Beulah.\*  
*O. juxta* Cress. Beulah.  
*O. n. sp.* Titus. Rociada. This is the species which I considered to be *O. mandibularis* Cress.; Mr. Titus has seen the type of *mandibularis*, and finds it distinct.

*Transition Zone.*

- O. pusilla* Cress. Trout Spring, Gallinas Canon. Fls. *Iris* in May.  
*O. iridis* Ckll. and Titus. Trout Spring.\* Fls. *Iris* in May.  
*O. chlorops* Ckll. and Titus. Trout Spring.\* Fls. *Iris* in May.  
*O. bruneri* Ckll. Barela Mesa (A. Gohrman).

*Transition to Upper Sonoran.*

- O. lignaria* Say. S. F.; L. V.; Romersville; Organ Mts.; Paraje.

*Transition to Middle Sonoran.*

- O. cerasi* Ckll. S. F.; M. V.\*

*Upper Sonoran.*

- O. novomexicana* Ckll. L. V.\*; Johnson Park, July 4, fls. loco-weed (A. Gohrman).  
*O. lignaria lignariella* Ckll. L. V.; Romersville.\*  
*O. ribifloris* Ckll. L. V.; Romersville.\*

*Middle Sonoran.*

- O. phenax* Ckll. M. V.\*  
*O. prunorum* Ckll. M. V.\*

**ALCIDAMEA** Cress.

- A. biscutellæ* Ckll. M. V.\*

**CHELOSTOMA** Latr.

- C. neomexicanum* Ckll. Barela Mesa.\* (A. Gohrman).

**HERIADES** Spinola.*Canadian to Middle Sonoran.*

- H. carinatus* Cress. Beulah; S. F.; Mescalero; M. V.

*Transition.*

- H. crucifera* Ckll. S. F.\*

*Upper Sonoran.*

- H. gracilior* Ckll. Rio Ruidoso, fls. *Rhus*; Pecos (W. P. C.); L. V.; Organ Mts.\*  
*H. variolosus* Cress. Rinconada.

*Middle Sonoran.*

- H. asteris* Ckll. M. V.\*

**ASHMEADIELLA** Ckll.*Canadian to Upper Sonoran.*

- A. buconis* Say. Beulah; L. V.; Albuquerque.  
*A. cactorum* Ckll. Beulah; S. F.\*; L. V.

*Upper Sonoran.*

- A. opuntiae* Ckll. Organ Mts.\*

*Upper to Middle Sonoran.*

*A. melloti* Ckll. Organ Mts.; M. V.\*

*Middle Sonoran.*

*A. bigeloviae* Ckll. M. V.\*

*A. prosopidis* Ckll. M. V.\*

*A. holti* Ckll. M. V.\*

**LITHURGUS** Berthold.

*L. apicalis* Cress. S. F.; Pecos, fls. *Opuntia*, July 16 (W. P. C.).

*L. apicalis opuntiae* Ckll. M. V.\*

*L. echinocacti* Ckll. Organ Mts.\*; M. V. Visits *Echinocactus wislizenii*.

**MEGACHILE** Latr.*Hudsonian to Upper Sonoran.*

*M. wootoni* Ckll. Top of Las Vegas Range; Beulah; Rio Ruidoso\*; Trout Spring; Johnson Park; Pecos.

*M. vidua monardarum* Ckll. Top of Las Vegas Range; Crew's Mesa\*; Beulah; Rio Ruidoso; Pecos (W. P. C.); a variety with the scopa paler than usual, at fls. *Campanula rotundifolia*, auctt. Beulah, Aug. 16 (W. P. C.) In the ♂ I cannot separate this species from the European *M. willughbielli* Kirby.

*Canadian Zone.*

*M. relativa* Cress. Harvey's Ranch; Beulah, fls. *Polemonium*; Rociada; Rio Ruidoso.

*Canadian to Transition.*

*M. pollicaris pereximia* Ckll. Beulah\*; High Rolls (V.). This is the *pollicaris* of Cresson (Mr. Titus has compared it), but I think probably not the true insect of Say. Snow has taken it at Bill Williams' Fork, Arizona (det. Titus).

*Canadian to Upper Sonoran.*

*M. sapellonis* Ckll. Harvey's Ranch, 9600 ft.; Beatty's Cabin (W. P. C.); Beulah\*; White Mts.; Pecos, Aug. 17 (W. P. C.).

*M. pugnata* Say. Beulah; S. F.; L. V.; Mescalero; near Viveash Ranch, 8800 ft. fls. *Erigeron*, July 21, ♀ (W. P. C.).

*M. fidelis* Cress. Beulah; L. V. H. S.; L. V.; Rio Ruidoso; Mescalero; Gila R.; San Ignacio; Burnt Canon.

*M. montivaga* Cress. Beulah, fls. *Geum* and *Roripa*; Rio Ruidoso; Raton.

*M. fortis* Cress. Beulah; San Ignacio; L. V. H. S.; Las Valles; Rociada; Mescalero; Rio Ruidoso.

*M. mendica* Cress. Rio Ruidoso; Las Valles. Visits *Verbascum*.

*Transition to Upper Sonoran.*

*M. latimanus* Say. S. F.; L. V.; San Ignacio; Trout Spring; Pecos (W. P. C.); Raton.

*M. exilis* Cress. S. F.; L. V.; Gila River; Rio Ruidoso; L. V. H. S.; Las Valles.

*M. manifesta* Cress. L. V. H. S.; L. V.

*M. cleomis* Ckll. S. F.\*; L. V.; Pecos; Albuquerque.

*Transition to Middle Sonoran.*

*M. pruina* Smith. L. V. H. S.; L. V.; Chaves; M. V. Extends to So. Calif.  
(Lower Sonoran).

*Upper Sonoran.*

*M. heterodonta* Ckll. L. V.\*; Organ Mts.; Raton, Aug. 26.

*M. brevis* Say. Las Valles.

*M. sayi* Cress. Pecos; L. V., fls. *Verbena*.

*M. emoryi* Ckll. Pecos.\*

*M. sexdentata* Rob. Raton, July 31, 1903 (Karl Schivackhein).

*M. agustini* Ckll. Pecos.\* Extends to Los Angeles, Calif. (Lower Sonoran).

*Upper to Middle Sonoran.*

*M. occidentalis* Fox. Organ Mts.; M. V.\*; Alamogordo (V.).

*M. soledadensis* Ckll. Organ Mts.\*; M. V.

*M. cleomis lippiae* Ckll. Gila River; Organ Mts.\*; Roswell; Alamogordo (V.);  
M. V.

*M. sidalceæ* Ckll. Lone Mtn.\*; Organ Mts.; M. V.; Deming. Fls. *Prosopis*,  
*Opuntia*, etc.

*Middle Sonoran.*

*M. chilopsidis* Ckll. Rincon; M. V.\* Fls. *Prosopis* and *Chilopsis*.

*M. populi* Ckll. M. V.\*

*M. vallorum* Ckll. Socorro; M. V.\*

*M. newberryæ* Ckll. M. V.\* Fls. *Prosopis*.

*M. townsendiana* Ckll. Rincon; M. V.\*

*M. casadæ* Ckll. M. V.\*

*M. prosopidis* Ckll. Rincon; M. V.; Alamogordo (V.). Fls. *Prosopis* and  
*Chilopsis*.

**CÆLIOXYS** Latr.*Canadian Zone.*

*C. mœsta* Cress. Beulah.

*C. porteriæ* Ckll. Harvey's Ranch, 9600 ft.\*; Beulah (W. P. C.).

*C. alternata* Say. Beulah.

*Canadian to Upper Sonoran.*

*C. ribis* Ckll. Beulah; Romeroville.\*

*G. gilensis* Ckll. Rio Ruidoso; S. F.; Gila River\*; Gallinas River.

*Transition to Middle Sonoran.*

*C. octodentata* Say. S. F.; L. V.; Gila River; M. V.

*Upper Sonoran (and Probably Transition).*

*C. rufitarsis rhois* Ckll. Rio Ruidoso\*, at about 6500 ft., fls. *Rhus*.

*C. apacheorum* Ckll. Mescalero.\*

*C. grindeliæ* Ckll. Mescalero (a variety); L. V.\*

*Upper to Middle Sonoran.*

*C. sayi* Rob. L. V., M. V.

*Middle Sonoran.*

*C. menthæ* Ckll. M. V.; Deming.\*

*C. deplanata* Cress. M. V.

**MELISSODES** Latr.*Canadian to Upper Sonoran.*

*M. grindeliæ* Ckll. Tuerto Mtn., 8875 ft.; S. F.\*; L. V. H. S.; L. V.; Pecos, fls. *Sphæralcea fendleri*, Aug. 17 (W. P. C.); Organ Mts. Extends to La Jolla, Calif. (Lower Sonoran).

*M. confusa* Cress. (*ruidosensis* Ckll.). Beulah; Rio Ruidoso; L. V.

*M. blakei* Ckll. Beulah\*; Tularosa Creek, fls. *Chrysothamnus*.

*Transition.*

*M. hewetti* Ckll. S. F.\*

*Transition to Upper Sonoran.*

*M. sphæralcææ* Ckll. S. F.\*; Pecos.

*M. menuacha* Cress. S. F.; L. V.; Raton. Fls. *Grindelia*, etc.

*M. pallidicincta* Ckll. S. F.; L. V.; Romersville; Pecos; Organ Mts.; Gila R.\*; Pinos Altos; Raton; Watrons; Gibson (A. Gohrman).

*Transition to Middle Sonoran.*

*M. agilis* Cress. S. F.; L. V.; San Ignacio; Organ Mts.; Albuquerque; Socorro; M. V. The var. *aurigenia* Cress. occurs at Las Vegas.

*M. obliqua* Say. S. F.; L. V.; Pecos; M. V.; Raton.

*Upper Sonoran.*

*M. gilensis* Ckll. Gila River\*; L. V.; Organ Mts. Extends to San Pedro, Calif. (Lower Sonoran).

*M. montana* Cress. Gila River; Organ Mts. Typ. loc. Colorado.

*M. humilior* Ckll. Organ.\*

*M. martini* Ckll. Las Valles.\* Fls. *Petalostemon*.

*M. chrysothamni* Ckll. Embudo.\*

*M. mizeæ* Ckll. L. V.\*

*M. pecosella* Ckll. Pecos.\*

*M. glenwoodensis* Ckll. Maxwell City, fls. *Grindelia* (Mize). Typ. loc. in Colorado.

*M. nigrosignata* Ckll. Near San Ignacio (W. P. C.). Typ. loc. in Arizona.

*M. lupina* Cress. Raton. 1 ♂, agreeing well with a co-type compared. Typ. loc. California.

*Upper to Middle Sonoran.*

*M. tristis* Ckll. L. V.; Magdalena Mts. (Snow); San Marcial; Organ Mts.; Mescalero; M. V.\*; Raton.

*M. menuacha submenuacha* Ckll. Albuquerque; M. V.\* Fls. *Helianthus* and *Verbesina*.

*M. thelypodii* Ckll. La Cueva, Organ Mts.\*; M. V., fls. *Ipomæa*.

*Middle Sonoran.*

- M. townsendi* Ckll. M. V.\*  
*M. kallstroemiæ* Ckll. M. V.\*  
*M. kallstroemiæ phenacoides* Ckll. M. V.\*  
*M. intermediella* Ckll. M. V.\* A variety occurs at Los Angeles, Calif.  
*M. helenæ* Ckll. M. V.\*  
*M. machærantheræ* Ckll. Near White Sands.\* Extends to Buckeye, Ariz.  
 (Lower Sonoran).  
*M. helianthelli* Ckll. M. V.\*  
*M. paroselæ* Ckll. M. V.\*  
*M. pecosella verbesinarum* Ckll. M. V.\*  
*M. texana flaveriæ* Ckll. Roswell,\* fls. *Flaveria*.

*Locality Unknown.*

- M. herricki* Ckll. "New Mexico."\*

**MARTINELLA** Ckll.

- M. luteicornis* Ckll. Rincon\*; M. V. Fls. *Prosopis*.

**TETRALONIA** Spinola.

- T. dilecta* Cress. L. V.; Barela Mesa.  
*T. truttæ* Ckll. Trout Spring, Gallinas Canon.\*  
*T. annæ* Ckll. Gibson.\*  
*T. lycii* Ckll. Engle; M. V.\*  
*T. crenulaticornis* Ckll. Rio Ruidoso\*; Mescalero.

**XENOGLOSSA** Smith.

- X. pruinosa* Say. L. V.; Pecos; Mescalero; M. V.  
*X. patricia* Ckll. M. V.\*  
*X. strenua* Cress. M. V.

**XENOGLOSSODES** Ashmead.

- X. imitatrix* Ckll. and Porter. L. V.\*; Glorieta (W. P. C.).  
*X. eriocarpi* Ckll. Organ Mts.\* Extends to Brownsville, Tex. (Low. Sonoran).  
*X. gutierrezæ* Ckll. Organ Mts.\*  
*X. excurrens* Ckll. Roswell.\*  
*X. lippinæ* Ckll. La Cueva\* and Dripping Spring, Organ Mts.  
*X. neotomæ* Ckll. Raton.\*

**ENTECHNIA** Patton.

- E. grisella* Ckll. and Porter. Las Valles.\*

**DASIAPIS** Ckll.

- D. ochracea* Ckll. S. F.; M. V.\*; Soledad Canon, Organ Mts. (Townsend).  
 Fls. *Sphæralcea*.

**DIADASIA** Patton.

- D. australis* Cress. Santa Fé Canon, 7700 ft., ♀ in flower of *Opuntia arborescens*  
 in wet weather; S. F.

- D. australis rinconis* Ckll. L. V.; Rincon\*; M. V.  
*D. enavata* Cress. M. V.  
*D. diminuta* Cress. S. F.; L. V.; Mescalero; M. V.  
*D. sphæralcearum* Ckll. M. V.\*  
*D. megamorpha* Ckll. M. V.\*; by White Sands.

**EMPHOROPSIS** Ashm.

- E. salviarum* Ckll. Top of Organ Mts.\*  
*E. n. sp.* Vier. (cf. Can. Entom., July, 1905, p. 265).

**CLISODON** Patton.*Arctic-Alpine to Upper Sonoran.*

- C. terminalis* Cress. Truchas Peak, just above timber-line (W. P. C.); Harvey's Ranch; Beulah; Pecos; Mescalero; Cloudcroft (V.).

**ANTHOPHORA** Latr.*Hudsonian to Upper Sonoran.*

- A. smithii* Cress. (incl. *cardui* Ckll.). Top of Las Vegas Range; Beulah (♂, Aug.); L. V. H. S.; L. V.; Mescalero; Lone Mtn.

*Canadian to Upper Sonoran.*

- A. neomexicana* Ckll. Beulah; Trout Spring; S. F.; L. V.\*; Pecos.

*Transition to Upper Sonoran.*

- A. marginata* Smith (incl. *cleomis* Ckll.). S. F.; L. V.; Rociada; Pecos.  
*A. occidentalis* Cress. S. F.; L. V.; Pecos; Mescalero.

*Transition to Middle Sonoran.*

- A. curta* Prov. S. F.; L. V.; Embudo; M. V. The var. *peritomæ* Ckll. occurs at S. F. and M. V.

*Upper Sonoran.*

- A. simillima* Cress. Placita, fls. *Ribes*.  
*A. gohrmanæ* Ckll. L. V.\*  
*A. porteri* Ckll. L. V.; Romersville\*; Engle. Extends to the Mojave Desert, Calif.  
*A. montana* Cress. L. V.; Pecos; Vega S. José; Organ Mts.  
*A. urbana* Cress. (incl. *alamosana* Ckll.). L. V.; Canada Alamosa; Albuquerque; Organ Mts.

*Middle Sonoran.*

- A. texana* Cress. M. V.; Deming.  
*A. lesquerellæ* Ckll. M. V.\*; Organ Mts.  
*A. phenax* Ckll. M. V.\*  
*A. affabilis* Cress. Engle; M. V.  
*A. centriformis vierecki* Ckll. Alamogordo (V.).\*



**ANTHOPHOROIDES** T. and W. Ckll.

*A. vallorum* Ckll. M. V.\*

**ANTHOPHORULA** Ckll.

*A. compactula* Ckll. Organ Mts.; M. V.\* Extends to Brownsville, Texas  
(Lower Sonoran).

*A. sidæ* Ckll. M. V.\*

**EXOMALOPSIS** Spinola.

*E. solani* Ckll. Albuquerque; \* Mescalero; Organ Mts.; M. V.

*E. solidaginis* Ckll. M. V.\*

*E. verbesinæ* Ckll. M. V.\*

**CENTRIS** Fabr.

*Middle Sonoran.*

*C. morsei* Ckll. M. V.\*

*C. morsei marginata* Fox. M. V.\* Extends to Douglas, Arizons, 3750 ft.

*C. rhodopus* Ckll. M. V.\*

*C. rhodopus pulchrior* Ckll. M. V.\*

*C. cæsalpinie* Ckll. M. V.\*

*C. hoffmanseggiae* Ckll. M. V.\*

*C. cockerelli* Fox. M. V.\*

*C. lanosa* Cress. M. V.

**XYLOCOPA** Latr.

*X. arizonensis* Cress. Lone Mtn.; Organ Mts.; M. V.

**CERATINA** Latr.

*C. neomexicana* Ckll. Chicorico Canon, near Raton\*; Rio Ruidoso; S. F.

*C. nanula* Ckll. M. V.\*

**PSITHYRUS** Lep.

*P. variabilis* Cress. Tuerto Mtn., 8200 ft.

*P. insularis* Smith. Beulah.

*P. cevallie* Ckll. M. V.\*

**BOMBUS** Latr.

*Arctic-Alpine to Hudsonian.*

*B. frigidus* Smith. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range. Typ. loc. Arctic America.

*Arctic-Alpine to Canadian.*

*B. flavifrons* Cress. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range; Beulah (Skinner). Var. *veganus* Ckll. is from top of Las Vegas Range.\*

*Arctic-Alpine to Transition.*

*B. huntii* Greene. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range; Harvey's Ranch; Beulah; Rio Ruidoso; Mescalero; Aztec. The synonymy of this species will be explained elsewhere by Mr. H. J. Franklin. Viereck reports var. *bifurius* Cress. from Beulah.

*Hudsonian to Canadian.*

- B. proximus** Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon.  
**B. appositus** Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon; Rio Ruidoso.  
**B. juxtus** Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon; Rio Ruidoso.

*Canadian Zone.*

- B. proximus perixanthus** Ckll. and Porter. Harvey's Ranch, 9600 ft.\*  
**B. monardæ** Ckll. and Porter. Beulah; Santa Fé Canon\*; Rio Ruidoso. Fls. *Monarda*, etc.  
**B. rufocinctus** Cress. Beulah.  
**B. consimilis** Cress. Beulah (fide Viereck).  
**B. centralis** Cress. Cloudcroft (fine Viereck).

*Canadian to Transition.*

- B. prunellæ** Ckll. Beulah\*; Rio Ruidoso; Mescalero. Ashmead has referred this to *silkensis*, but it is distinct from that species, as Mr. Franklin agrees.

*Canadian to Upper Sonoran.*

- B. iridis** Ckll. and Porter. Beulah\*; Santa Fé Canon; Pecos. Fls. *Iris*, etc.  
**B. fervidus** Fabr. Beulah; Rio Ruidoso; L. V.  
**B. nevadensis** Cress. (*cressoni* Ckll.). Beulah; Rio Ruidoso; Mescalero; White Mtn., 10,300 ft., fls. *Delphinium* (Townsend); L. V.  
**B. dorsalis** Cress. (*aztecus* Ckll. fide Franklin). Beulah; Rio Ruidoso; Mescalero; Aztec; L. V.  
**B. edwardsii** Cress. Beulah, May 30 (W. P. C.); Pecos, June 25, fls. *Fallugia* (W. P. C.).

*Transition Zone.*

- B. proximus howardi** Cress. San Ignacio.

*Transition to Middle Sonoran.*

- B. morrisoni** Cress. S. F.; L. V.; Albuquerque; M. V.; Organ Mts.; Rio Ruidoso; Mescalero; Romersville; Pecos.  
**B. sonorus** Say. Rio Ruidoso; M. V.; Pecos (a variety). Extends to San Pedro, Calif. (Lower Sonoran).

*Upper Sonoran.*

- B. scutellaris** Cress. L. V.

*Upper to Middle Sonoran.*

- B. americanorum** Fabr. L. V.; M. V.

**APIS** L. (introduced).

- A. mellifera ligustica** Spin. Beulah; S. F.; L. V.; Pecos, etc.

Undoubtedly many of the Middle Sonoran species range into the Lower Sonoran of Arizona and Mexico; how many, the imperfection of our knowledge prevents us from deciding. It is probable that the Middle Sonoran is to be distinguished from the Lower by the *absence* of various types existing in the latter, rather than by the presence of peculiar types of its own. The following species may be cited as occurring in the Lower Sonoran of Arizona, but apparently not entering New Mexico:

*Centris atripes* Mocs. (Douglas). *Oxæa tristis* Gribodo (Douglas). *Colletes tucsonensis* Ckll. (Tucson). *Xylcopa varipuncta* Patt. (Tempe). *Ceratina arizonensis* Ckll. (Phoenix). *Halictus kunzei* Ckll. (Phoenix). *Centris pallida* Fox (Phoenix). *Perdita baccharidis* Ckll. (Tempe). *P. mellina* Ckll. (Phoenix). *P. heterothecæ* Ckll. (Tempe, Phoenix). *Xenoglossa patricia angustior* Ckll. (Buckeye). *Hypomacrotera callops persimilis* Ckll. (Phoenix). *Bombomelecta arizonica* Ckll. (Tempe). *Triepeolus helianthi arizonensis* Ckll. (Phoenix). *T. pimarum* Ckll. (Alhambra).

Some of these reappear in the Lower Sonoran of Texas.

### *New Species.*

#### ***Xenoglossodes neotomæ* n. sp.**

A small species with narrow abdomen in the ♀, allied to *X. lippix*.

♀.—Length about 10½ mm.; hair of face, cheeks and pleura white; of head and thorax above pale ochreous; differs from *lippix* in being smaller, with the abdominal bands yellowish instead of white; the apical one on the second segment entire; the black interval between the bands on the third wider, being of the same width as the apical band; the fourth segment ornamented like the third, with the margin of the apical band straight; the fifth and sixth segments heavily fringed with creamy-white hair, stained with reddish in the middle; the hair on inner side of basal joint of hind tarsi very light fulvous; the hair of thorax above strongly yellowish; the antennæ considerably shorter, and the flagellum more or less dark reddish beneath. Runs in my tables near *T. actiosa*, but the mesothorax is shining, and the abdomen is of an entirely different shape.

♂.—Length 10 mm.; more like *lippix*; hair of head and thorax white above and below, or faintly yellowish above: flagellum long, strongly crenulate, very dark reddish beneath; clypeus and labrum entirely pale lemon yellow; mandibles with a large yellow spot; abdominal segments with only the apical hair-bands distinct; tegulæ pale testaceous.

In Proc. Biol. Soc. Wash., 1905, p. 179, I called attention to the *Xenoglossodes*-like palpi of *Tetralonia lippix*. The present species bridges over the gap between *lippix* and ordinary *Xenoglossodes* to a considerable extent, and I think both should be referred to that genus.

*Hab.*—Raton, New Mexico, August, 1 ♀, 2 ♂ (T. D. A. and W. P. Ckll.). *X. neotomæ* derives its name from *Neotoma*, the wood-rat, which gave rise to the name Raton.